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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/786,738      | 06/29/2001  | Leopold Bomer        | 12758-006001        | 4198             |

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EXAMINER

PHU, PHUONG M

ART UNIT PAPER NUMBER

2631

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/786,738

Applicant(s)

BOMER ET AL.

Examiner

Phuong Phu

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 12/13/04.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maskara et al., "Concatenated Sequences for Spread Spectrum Systems", IEEE Transactions on Aerospace and Electronic Systems, pages 342-350, VOL. AES-17, NO. 3, May 1981, provided by the applicant in the IDS filed on 12/19/01, (newly-cited).

-Regarding to claims 1 and 10-12, see figures 2 and 3 and pages 344-346, Maskara et al discloses a method and associated system comprising:

step/means (see figure 3A) of storing and transmitting a signal sequence (CONCATENATED SEQUENCE) of length  $n=L=L_1 \times L_2$  (see figure 2C) (equivalent with "signal sequence  $K(i)$  of length  $n$ " of claims 1 and 12, with "synchronization sequence" of claims 10 and 11) from a first station, shown in figure 3A, (equivalent with the limitation "base station" of claim 1), to a second station, shown in figure 3(B), (equivalent with "mobile station" of claim 1), the signal sequence (CONCATENATED SEQUENCE) being formed by repeating,  $n_1$  times ( $n_1=L_1$ ), a second signal sequence element ("inner" sequence) of length  $n_2$ , ( $n_2=L_2$ ), (equivalent with "second signal sequence element  $K_2(k)$  of length  $n_2$ " of claim 1), to form a second signal sequence (figure 2B), the second signal sequence being modulated by means (X)

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(see figure 3) with first signal sequence elements (“outer” sequence) (see figure 2A) of length  $n_1$ , (equivalent with “first signal sequence  $K1(j)$  of length  $n_1$ ” of claim 1).

Maskara et al does not disclose whether  $n_1$  can be equal to  $n_2$ .

However, Maskara et al novelty is to be able to reduce number of tapped delay lines (TDL) which are needed in a spread spectrum receiving system by utilizing a concatenated sequence for spreading signals to be transmitted in a spread spectrum transmitting system to the spread spectrum receiving system, in comparison with the case of utilizing a non-concatenated sequence (see pages 342-343).

Therefore, for an application, it would have been obvious for one skilled in the art, when building or carrying out Maskara et al invention, within his skills, and upon his design preference or system requirement, to implement the signal sequence (CONCATENATED SEQUENCE) of length  $n$  ( $n=n_1 \times n_2=L \times L_i$ ) by repeating,  $n_1$  times ( $n_1=L_o$ ), a second signal sequence element (“inner” sequence) of length  $n_2$ , ( $n_2=L_i$ ) to form a second signal sequence, the second signal sequence being modulated with first signal sequence elements (“outer” sequence) of length  $n_1$ , wherein  $n_1$  can be equal to  $n_2$ , in order to able to reduce number of tapped delay lines (TDL) which are needed in a spread spectrum receiving system, without affecting the overall system performance.

-Regarding to claim 2, Maskara et al does not disclose whether  $n$  is equal to 256, and  $n_1=n_2=16$ . However, as similar reasons applied for claim 1, it would have been obvious for one skilled in the art that Maskara et al invention could be implemented in such a way that  $n$  is equal to 256, and  $n_1=n_2=16$ , without affecting the overall system performance.

-Regarding to claim 3, in Maskara et al, signal sequence (CONCATENATED SEQUENCE) (figure 2C) is inherently formed as claimed (see figures 2A, 2B and 2C).

-Regarding to claim 4, Maskara et al discloses step/means of receiving, at the second station (see figure 3B), a received signal sequence (CONCAT. SEQ. INPUT) (equivalent with "E(1)"), the signal sequence (CONCATENATED SEQUENCE) being contained in the received signal sequence and being determined by obtaining a correlation sum S of the signal sequence (CONCATENATED SEQUENCE) with corresponding sections of the received signal sequence; wherein the second station determines the correlation sum S by using:

step/means (INNER SEQU. MFC) (see figure 3B) of determining a partial correlation sum sequence TS(z) (outputted from (INNER SEQU. MFC)) of the second signal sequence ("inner sequence") using corresponding parts of the received signal sequence.

Maskara et al is silent about procedures of  
selecting n1 elements of the partial correlation sum sequence TS(z); and  
multiplying the selected elements of the partial correlation sum sequence TS(z) by the first signal sequence elements ("outer" sequence").

However, Maskara et al discloses the use of matched filter correlator (OUTER SEQUE. MFC) for further match the partial correlation sum sequence with the first signal sequence elements (see figure 3B and page 344). Maskara et al also discloses that the operation of a matched filter correlator can be performed by selecting L elements of a first input sequence and multiplying the selected elements by respective L elements of a second input sequence of length L in order to match first input sequence with the second input sequence (see figure 1 and page 343).

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Therefore, for an application, it would have been obvious for one skilled in the art that, in Maskara et al invention, at the second station (see figure 3B), the operation of the matched filter correlator (OUTER SEQUE. MFC) could be implemented to match the partial correlation sum sequence with the first signal sequence elements of length  $n_1$  by selecting  $n_1$  elements of the partial correlation sum sequence  $TS(z)$ ; and multiplying the selected elements of the partial correlation sum sequence  $TS(z)$  by the first signal sequence elements ("outer" sequence").

-Regarding to claim 5, as applied to claim 4, in Maskara et al, it would have been obvious that selecting  $n_1$  elements can be performed by selecting  $n_1$  in each of  $n_2$  elements of the partial correlation sum sequence.

-Regarding to claim 9, Maskara et al discloses that in the second station, the signal sequence (CONCATENATED SEQUENCE) is determined by using information about the first signal sequence element ("outer" sequence) and the second signal sequence element ("inner" sequence) (see figure 3B, and page 344).

-Claim 6 is rejected with similar reasons set forth for claim 4.

-Claim 7 is rejected with similar reasons set forth for claim 5.

-Regarding to claim 8, as similar reasons applied to claim 4, in Maskara et al, the operation of the matched filter correlator (OUTER SEQUE. MFC) can be performed by using (TDL) (see figure 1A) of storing the partial correlation sum, and (x's, SUMMER) of using the partial correlation sum in order to determined a further correlation sum.

#### ***Response to Arguments***

4. Applicant's arguments filed on 12/13/04 have been fully considered but they are not, in part, persuasive with the following reasons:

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The previous objections on Drawing and Specification have been withdrawn since corresponding amendments were filed to overcome the objections.

The previous rejections, under 35 USC 112, have been withdrawn since corresponding amendments were filed to overcome the rejections.

However, claims 1-12, after being amended or newly-added, are deemed not patentable over Maskara et al in the new ground of rejection as set forth above in this Office Action.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 571-272-3009. The examiner can normally be reached on M-F (6:30-2:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Phuong Phu*

Phuong Phu  
03/30/05

**PHUONG PHU**  
**PRIMARY EXAMINER**

Phuong Phu  
Primary Examiner  
Art Unit 2631